funkwerk
enterprise communications

WLAN ACCESS POINT

Industry access point

bintec WIx040n

MPG certificated EM COMPATIBLE EN 60601-1-2

abg WiFi n CERTIFIED®
dual-stream n

- WLAN according IEEE 802.11n, compatible with .11agbh
- With 1 or 2 radio modules, dual band radio
- Operation as access point, bridge, WDS, client
- PoE, optional with fiber optic WAN interface
- Protection class IP40, extended temperature operating
- Certified for operating in vehicles

Hard to beat

WI1040n | WI2040n

- o 802.11n industrial access point configurable as AP, WDS repeater, WLAN client, bridge
- o Dual band 2.4 / 5 GHz, optionally with either one or two wireless modules
- o Power supply optionally via 24V DC or PoE
- o WAN optionally via Ethernet or optical fiber cable
- o Extended temperature range -25°C to +65°C
- o Flexible industrial application scenarios with protection class IP40
- o Operation in vehicles permitted with E1 approval
- o Tested to EN50121 for operation in railroad vehicles
- o Operation is medical institutions permissible in accordance with EN60601
- o Operation as fat AP or as controller based AP via bintec WLAN controller

The bintec WIx040n series devices are industry-proof access points with protection class IP40, which can be deployed in industry or other harsh application scenarios. The stable, dustproof metal casing and the wide temperature range also allow deployment under extreme environmental conditions. Depending on the model, the devices have one or two IEEE 802.11agbn standard wireless modules and allow PHY rates of up to 300 Mbps per wireless module.

WIx040n for wireless networking of moving machines
Besides the access point mode, the WIx040n can also be operated as a WLAN client. In this mode you can connect machines and devices wireless to your infrastructure. Here it is irrelevant whether your machines have an Ethernet or a serial interface. The bintecWIx040n devices support both connection options.

WIx040 in vehicles
The E1 approval provided means that the WIx040 series devices may be installed in vehicles and powered directly from the vehicle's 24 Volt on-board network. Numerous applications arise in public transportation for example – from updating passenger information through to automatic exchange of passenger data on entry in the bus depot or on arrival at stops.

WIx040n in warehouse management
If you have to supply a large warehouse with WLAN, e.g. to connect your wireless hand scanner to your enterprise resource management system, the bintec WIx040n series devices help you overcome many obstacles.
In this scenario and in conjunction with sound wireless cell planning, the WI devices' IAPP protocol provides for optimized roaming behavior of the terminal devices. The optional optical fiber WAN interface spans up to 2 km thus also allowing access points at remote parts of the plant site to also be operated.

Management
Here you have the choice between several solutions.

To configure individual devices you only need you Internet browser. The web server integrated in the device allows fast configuration and monitoring via the graphical user interface.

For larger installations, the complimentary DIME Manager assists in automatically finding unconfigured devices in the network and enables specific configuration of devices.

WLAN Controller

Optimize your WLAN network by using a bintec WLAN controller. The bintec WLAN controller allows configuration of your customers WLAN network in lesser than 30 minutes ... and this without deeper WLAN know-how! The automatic RF management system relieves you the time killing search for free WLAN channels and selects the best channels for the system. For smaller WLAN networks up to 6 APs the WI1040/WI2040 is able to take over the function of the WLAN controller by itself and works as quasi master AP. For networks with more than 6 up to 24 APs you will need a bintec R1202 as WLAN controller hardware.

Versions

Feature	Description
WI1040n	One Dualband Radio, for Indoor usage protection class IP40, three removeable antennas; part number 5010590006
WI2040n	Two Dualband Radios, for Indoor usage protection class IP40, four removeable antennas; part number 5010590007

Security

Feature	Description
Encryption WEP/WPA	WEP64 (40 Bit key), WEP128 (104 Bit key), WPA personal, WPA enterprise, WPA2 personal, WPA2 enterprise
IEEE802.11i authentication and encryption	802.1x/EAP-MD5, 802.1x/EAP-TLS, 802.1x/EAP-TTLS, 802.1x/EAP-PEAP, key management, PSK/TKIP encryption, AES encryption, 802.1x/EAP
Access control list (ACL)	MAC address filter for WLAN clients
VLAN	Network segments on layer2 possible. Per SSID one VLAN ID available. Static VLAN configuration according IEEE 802.1q; up to 32 VLANs supported.
Inter cell repeating	Inter traffic blocking for public hot spot (PHS) applications for preventing of communication radio client to radio client in a single radio cell.
NAT/PAT	Network & Port Address Translation / Stateful Packet Inspection: Isolation of complete network from public access
VPN - IPSec	10 tunnels inclusive, 100 more via separate license
VPN - IPSec	Powerful encryption up to 256 bits (AES, 3DES, DES, CAST, Blowfish, Twofish)
VPN - IPSec DPD	Dead Peer Detection for IPSec tunnels
VPN - PPTP	Integrated
VPN - PPTP	Strong encryption up to 128 bits (MPPE), up to 168 bits (DES/3DES, Blowfish)
DynDNS / DynVPN	Router can still be reached over the Internet in spite of dyn. IP address
IKE for IPSec	Pre-Shared Keys and X.509 certificate support
X.509	X.509 v1/v3 certificates (PKCS#7/8/10, 12, CLRs, SCEP)
QoS for IPSec	Available
PKI Support for IPSec	Available
NAT Traversal for IPSec	Available
IPCOMP	IP compression
IPSec / RADIUS	Available
IPSec redesign	Policy manager and interface concept
L2TP	Layer 2 tunnelling protocol for ATM, Ethernet, PPP; user authentication
GRE	V.0 according RFC 2784 for common encapsulation
Hardware encryption	3DES, AES and RC4

Wireless LAN Features

Feature	Description
WLAN standards	802.11n (Mimo 2x3); 802.11b; 802.11g; 802.11a; 802.11h
Frequency bands 2.4 GHz indoor/outdoor (EU)	2.4 GHz Indoor/Outdoor (2412-2472 MHz) max. 100 mW EiRP. This information is related to the permitted transmission power in Germany. The permitted transmission power may vary in other countries.
Frequency bands 5 GHz indoor (EU)	5 GHz indoor (5150-5350 MHz) max. 200 mW EiRP allowed. This information is related to the permitted transmission power in Germany. The permitted transmission power may vary in other countries.
Frequency bands 5 GHz outdoor (EU)	5 GHz outdoor (5470-5725 MHz) max. 1000 mW EiRP allowed. This information is related to the permitted transmission power in Germany. The permitted transmission power may vary in other countries.
Frequency bands 5.8 GHz BFWA (Germany)	5.8 GHz BFWA (5755-5875 MHz) max. 4000 mW EiRP allowed. This information is related to the permitted transmission power in Germany. For the usage in other countries, please contact the location regulation authorities.
WLAN modes	2.4 GHz operation: 802.11b only; 802.11g only, 802.11b/g/n mixed; 802.11b/g/n mixed long; 802.11b/g/b mixed short; 802.11b/g/n; 802.11g/n; 802.11n only; 5 GHz Operation: 802.11a only; 802.11a/n; 802.11n only
Automatic Rate Selection (ARS)	Available
Transmission rate	Automatic fallback or fixed transmission rate selectable
Data rates for 802.11b,g (2.4 GHz)	11, 5.5, 2 und 1 Mbps (DSSS modulation); 54, 48, 36, 24, 18, 12, 9 and 6 Mbps (OFDM modulation)
Data rates for 802.11a,h (5 GHz)	54, 48, 36, 24, 18, 12, 9 and 6 Mbps (OFDM modulation)
Data rates for 802.11n (2.4 / 5 GHz)	MSC0-15 enables physical rates up to 150 Mbps at 20 MHz channels bandwidth, 2 streams, short guard interval; MSC0-15 enables physical data rates up to 300 Mbps at 40 MHz channels bandwidth, 2 streams, short guard interval
Receiver Sensitivity @ 2.4 GHz 802.11b/g	1 Mbps -91 dBm; 2 Mbps -90 dBm; 5.5 Mbps -89 dBm; 11 Mbps -88 dBm; 6 Mbps -90 dBm;9 Mbps -89 dBm; 12 Mbps -88 dBm; 18 Mbps -86 dBm; 24 Mbps -83 dBm; 36 Mbps -80 dBm; 48 Mbps -76 dBm; 54 Mbps -74 dBm
Receiver Sensitivity @ 2.4 GHz 802.11n 20 MHz	MSC0 -89 dBm; MSC1 -87 dBm; MCS2 -85 dBm; MCS3 -82 dBm; MCS4 -79 dBm; MSC5 -75 dBm; MCS6 -73 dBm; MCS7 -70 dBm; MCS8 -83 dBm; MCS9 -84 dBm; MCS10 -81 dBm; MCS11 -79 dBm; MCS12 -80 dBm; MCS13 -72 dBm; MCS14 -68 dBm; MCS15 -67 dBm
Receiver Sensitivity @ 2.4 GHz 802.11n 40 MHz	MSC0 -87 dBm; MSC1 -84 dBm; MCS2 -82 dBm; MCS3 -79 dBm; MCS4 -75 dBm; MSC5 -71 dBm; MCS6 -69 dBm; MCS7 -67 dBm; MCS8 -86 dBm; MCS9 -83 dBm; MCS10 -79 dBm; MCS11 -77 dBm; MCS12 -74 dBm; MCS13 -69 dBm; MCS14 -67 dBm; MCS15 -65 dBm
Receiver Sensitivity @ 5 GHz 802.11a/h	6 Mbps -88 dBm; 9 Mbps -87 dBm; 12 Mbps -86 dBm; 18 Mbps -84 dBm; 24 Mbps -82 dBm; 36 Mbps -78 dBm; 48 Mbps -74 dBm; 54 Mbps -73 dBm
Receiver Sensitivity @ 5 GHz 802.11n 20 MHz	MSC0 -88 dBm; MSC1 -85 dBm; MCS2 -83 dBm; MCS3 -81 dBm; MCS4 -78 dBm; MSC5 -74 dBm; MCS6 -72 dBm; MCS7 -70 dBm; MCS8 -88 dBm; MCS9 -85 dBm; MCS10 -83 dBm; MCS11 -80 dBm; MCS12 -77 dBm; MCS13 -72 dBm; MCS14 -70 dBm; MCS15 -68 dBm
Receiver Sensitivity @ 2.4 GHz 802.11n 40 MHz	MSC0 -84 dBm; MSC1 -82 dBm; MCS2 -79 dBm; MCS3 -77 dBm; MCS4 -74 dBm; MSC5 -69 dBm; MCS6 -67 dBm; MCS7 -66 dBm; MCS8 -83 dBm; MCS9 -82 dBm; MCS10 -79 dBm; MCS11 -76 dBm; MCS12 -72 dBm; MCS13 -68 dBm; MCS14 -66 dBm; MCS15 -64 dBm
Output power (without antenna gain)	Adjustable in following steps: 5, 8,11,14,16 und 17.5 dBm. Maximal power varies depending on data rate and frequency band.
Tx Power @ 2.4 GHz 802.11b/g	1 Mbps 16 dBm; 2 Mbps 16 dBm; 5.5 Mbps 16 dBm; 11 Mbps 16 dBm; 6 Mbps 17,5 dBm; 9 Mbps 17,5 dBm; 12 Mbps 17 dBm; 18 Mbps 17 dBm; 24 Mbps 15 dBm; 36 Mbps 15 dBm; 48 Mbps 13 dBm; 54 Mbps 13 dBm
Tx Power @ 2.4 GHz 802.11n 20 MHz/40 MHz	MSC0 17.5 dBm; MSC1 17,5 dBm; MCS2 17 dBm; MCS3 17 dBm; MCS4 15 dBm; MSC5 15 dBm; MCS6 13 dBm; MCS7 13 dBm; MCS8 17.5 dBm; MCS9 17.5 dBm; MCS10 17 dBm; MCS11 17 dBm; MCS12 15 dBm; MCS13 15 dBm; MCS14 13 dBm; MCS15 13 dBm
Tx Power @ 5 GHz 802.11b/g	1 Mbps 16 dBm; 2 Mbps 16 dBm; 5.5 Mbps 16 dBm; 11 Mbps 16 dBm; 6 Mbps 17.5 dBm; 9 Mbps 17.5 dBm; 12 Mbps 17 dBm; 18 Mbps 17 dBm; 24 Mbps 15 dBm; 36 Mbps 15 dBm; 48 Mbps 13 dBm; 54 Mbps 13 dBm
Tx Power @ 5 GHz 802.11n 20 MHz/40 MHz	MSC0 17.5 dBm; MSC1 17.5 dBm; MCS2 17 dBm; MCS3 17 dBm; MCS4 15 dBm; MSC5 15 dBm; MCS6 13 dBm; MCS7 13 dBm; MCS8 17.5 dBm; MCS9 17.5 dBm; MCS10 17 dBm; MCS11 17 dBm; MCS12 15 dBm; MCS13 15 dBm; MCS14 13 dBm; MCS15 13 dBm
Number of spatial streams (802.11n)	1 or 2
Bandwidth (802.11n)	20/40 MHz (bundling of two adjoining 20 MHz channels to one 40 MHz channel)
Short guard interval (802.11n)	On/off switchable; increase of throughput by reduction of the guard intervals from 800ns to 400ns
DTIM Period	Adjustable
Multi SSID	Depending on the complexity of configuration up to 8 service sets per radio module, with virtual access points and own MAC address per SSID.
Broadcast SSID	On/off switchable
Clients (Pwr. Managmt./max number)	Registering of up to 250 clients per radio module simultaneously in access point mode. Default

	value is 32 clients.
Country-specific settings	Channel settings according regulatory domain (802.11d) permitted.
TPC	TPC (transmission power control): For 5 GHz, automatic reduction of transmission power according EN301893
DFS	DFS (dynamic frequency selection): For 2.4 and 5 GHz, channels are dynamically used depending on operating grade. DFS is implemented in bridge links master and slave.
RTS/CTS	RTS/CTS threshold adjustable

Maintenance and Service

Feature	Description
Configuration a. maintenance: Device	Telnet, SSH, HTTP, HTTPS, SNMP
Configuration a. maintenance: SNMP	SNMP (v1, v2, v3), USM model, VACM views, SNMP traps (v1, v2, v3) configurable, SNMP IP access list configurable
Configuration a. maintenance: SNMP	Complete management with MIB-II, MIB 802.11, enterprise MIB
Configuration a. maintenance: SSH	Supports SSH V1.5 and SSH V2.0, for secure connections of terminal applications
Configuration a. maintenance: HTTP/HTTPS	Web-based configuration (FCI). The user interface is identical with almost all Funkwerk products.
Configuration a. maintenance: Secure	SSH available, HTTPS, Telnet protected against 'bruce force attacks'
Configuration a. maintenance: Configuration export and import	Load and save of configurations; save configuration optionally encrypted; optional, automatic controlled via scheduler
Configuration a. maintenance: On the	No restart is required after the configuration has been changed.
Configuration a. maintenance: Software update	Software updates free of charge; loadable via file, HTTP or via direct access to the FEC server; optional, automatic controlled via scheduler
External reporting: Syslog	Syslog client, with different levels of messaging.
External reporting: eMail alert	Automatic eMail alert by definable events
External reporting: SNMP traps	Supported
External reporting: Activity monitor	Sending of information to a PC on which Brickware is installed
Monitoring: Internal Log	Output via web-based configuration interface (http/https), filter: subsystem, level, message
Monitoring: IPSec	Displayed: IPSec tunnels and IPSec statistics; output via web-based configuration interface (http/https)
Monitoring: Interfaces	Statistic information of all physical and logical interfaces (ETH0, ETH1, SSIDx, ...)
Monitoring: WLAN	Detailed displays for radio, VSS, WDS link, bridge links, client links. Displayed are per link: MAC address, IP address, TX packets, RX packets, signal strength for every receiving aerial, signal-to-noise ratio, data rate
Monitoring: Configurable scheduler	Following events can be scheduled: Reboot device, activate/deactivate interface, activate/deactivate WLAN, initiate 5 GHz band scan, trigger SW update, trigger configuration backup
Management: Supported	bintec WLAN Controller, DIME Manager, XAdmin
Management: Discovery Protocol	CAPWAP DHCP option according RFC1517
Management: Discovery function	Protocols: Madge Discovery Protocol (MDP), Funkwerk discovery protocol (ADP), works also across subnets
Documentation	German and English documentation on CD and in the Internet for download
Guarantee	2-year manufacturer's guarantee, Online RMA handling
Service Package 'large' (art.no. 5500000811)	Warranty extension of 3 years to a total of 5 years, including advanced replacement for FEC products of the category "small". Please find a detailed description as well as an overview of the categories on www.funkwerk-ec.com/servicepackages

Software Features

Feature	Description
Roaming (access point mode)	Seamless roaming with IAPP (artem Inter Access Point Protocol)
Fast roaming 802.1x (access point	Pre authentication and PMK caching allows fast roaming by 802.1x encryption
Roaming behaviour (client mode)	Adjustable (no, slow, normal, fast, customized roaming). Adaptable for fast movable client (i.e. vehicle), to guarantee a roaming without interruption. This is achieved by scanning of the relevant channels in the background.
WDS	Wireless Distribution System: Include high security TKIP and AES, interoperable with other devices from the Funkwerk-EC portfolio (not bintec W500)
Bridge: point-to-point / point-to-multipoint	Point-to-point connection between two access points, point-to-multipoint connection between up to eight partners access points
Bridge	Full remote configuration: Protocol with encrypted transmission. RTS/CTS threshold adjustable. Operating channels: According to the regulatory domain. Transmit speed: Auto fallback or selectable fixed rate.
Bridge link test	Via the link test the quality of a bridge link can be measured.
Bridge link encryption	With high security TKIP and AES possible
Client mode	Routing or bridge mode possible. In bridge mode multiple IP based end devices can be operated simultaneously and additionally one non-IP-based end device
Buffer pool	For cushioning of peaks
WMM 802.11e QoS	Data prioritization for TOS data, 802.11e/WMM
WMM Power Save (U-APSD)	Support of active WLAN clients, which support 802.11e power save
Internet dialup	PPPoE, PPTP
Load balancing	Session-round-robin, load-dependent bandwidth
BLD	Broken Link Detection (BLD) per SSID possible.
NTP	NTP client, NTP server, manually
DNS	DNS client, DNS server, DNS relay
DHCP	DHCP client, DHCP server, DHPC relay

Hardware Features

Feature	Description
Certifications	Wi-Fi Certified according 802.11abgn (Rel.7.9.4)
Standards and certifications	R&TTE Directive 1999/5/EG; EN 60950-1 (IEC60950); EN 60950-22; EN 301489-1; EN301489-17; EN 55022; EN 300328-1; EN 301893; EN 302502; EN 50371
Medical standards and certifications	EN 60601-1; EN 60601-2; EN 55011
Railway and automotive standards	EN 50121-3-2; ISO 7637-1; ISO 7637-2, E1-mark
Wifi Certification	Wifi Certified product according IEEE 802.11abgn under preparation
LAN / WAN	2 x 10/100 Mbps Ethernet twisted pair, autosensing, auto MDI/MDI-X
Optical WAN/LAN Interface	SFP slot for 100 Mbps Fibre Transceiver. Only one ETH interface is activated, if SFP module is plugged
Serielle Schnittstelle	V.24 interface with D-Sub9 jack for configuration and for data transmission over IP
WAN	WI1040n: IEEE 802.11a/b/g/n; 1 radio module, 2.4 und 5 GHz band, 3 external antennas; WI2040n: IEEE 802.11a/b/g/n; 2 radio module, 2.4 und 5 GHz band, 4 external antennas
Antenna for WI1040n	Three antenna connectors with RTNC jacks; delivered incl. three 2 dBi omni-directional antennas
Antenna for WI2040n	Four antenna connectors with RTNC jacks; delivered incl. four 2 dBi omni-directional antennas
Temperature Sensor	Temperature supervision and software controlled interaction. Controlling of the radio module heading at temperature below -10°C.
Alarm relay	Controlled by software i.e. for alarm, overtemperature, undertemperature; 1A 42V AC / 2A 30V DC
Real time clock	Even at power loss the system time will be available for several hours.
Power supply	Power requirements: 24V +/-30% max. 1 A; Operation with two redundant power supplies supported; Operation is indepent of the Polarity of the power supply; Power supply unit is not include in the delivery
PoE	Power-over-Ethernet according IEEE 802.3af
Status LEDs	Status + activity for WLAN, Ethernet 1, Ethernet 2; SFP, Failure
Montage	Wall mounting include; DIN Rail mounting as an option available
Theft protection	Theft protection optional available
Protection class	IP40 protected for indoor usage
Dimensions	215mm x 40mm x 165mm (width x height x depth)
Weight	Approx. 1200g
Environment	Temperature operating: -25°C to +65°C; storage: -40°C to 85°C; rel. humidity 10 to 95% (non condensing)